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AUTHOR Ross, Eugene
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ABSTRACT

Perspectives on the improvement of college teaching and the contribution of high technology teaching tools are discussed. After reviewing some definitions of excellence in teaching found in the literature, the following competencies that are characteristic of "good" teachers are proposed: excellent knowledge of subject area; good organization; enthusiasm for subject and teaching; empathy toward students; good communication; fairness and impartiality; adaptability to new techniques and knowledge; development of creative and inquiring minds; and a sense of humor. It is suggested that the effective teacher will use the appropriate high tech teaching mechanisms to increase teaching effectiveness. Technological aids include computer assisted/managed instruction, audio tape cassettes, microcomputer-based courses, and video discs. Using technology, students who live great distances from campus can still be actively involved in curricular activities. In addition, influential experts can share their knowledge on campus through telecommunications and video. It is recommended that the administrator should provide opportunities, encouragement, and incentives to improve teaching. (SW)

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TEACHING, TECHNOLOGY, AND THE FUTURE

Eugene Ross, Professor, New Mexico State University

Teaching

The advent of the 1980's has brought the issues of effective teaching to the foreground. Falling enrollments in higher education and the conservative mood of legislators have seriously affected the budgets of educational institutions. Although good teachers have always been in demand, recently, increased attention has been placed on teaching effectiveness. Contemporary conditions, such as civil rights suits resulting from performance evaluations or the misuse of tenure as a means of employment security rather than as an environment for seeking and teaching the truth, have caused the professional teacher and administrator to explore measurable factors associated with teaching effectiveness.

Attempts to operationally define good teaching or to characterize an effective teacher have produced varying and often vague results. Rouche and Watkins while discussing "great" teaching in a community college setting cite Hildegrand and Wilson who suggest that the instructor should go beyond simply delivering facts, patterns or themes, or implications or concepts to support facts. They emphasize the instructor should be clear, well organized and effectively use examples and appropriate analogies. Further, the instructor must be able to effectively manage groups - control, pace, and stimulate effective interaction[1]. According to Hildegrand and Wilson genuine concern

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for learners as individuals is an essential part of relevant pedagogy and the teacher's eager interest for teaching his subject is absolutely necessary! Rouche and Watkins also cite Schneider et. al. in their study which describes effective teachers of adults as "those who successfully perform a balancing act. They balance classroom teaching with mentoring or advising on a one-to-one basis; student centeredness with highly directive and prescriptive behavior; a clear focus on task with creative, flexible options for student participation".[2] They go on to say that "excellent faculty are those who engage students in their own learning while demanding excellence."[3]

"Good teaching", according to Lewis, has been defined as "what the teacher does to produce inspired pupils, excited pupils, interested pupils, creative pupils, pupils who are good citizens, who can read, do arithmetic problems and write grammatical English essays." Lewis goes on to define good teaching as "developing critical thinking, subject matter mastery, ideals, love of freedom, respect for law and order, universal brotherhood, various attributes of character, a love of learning and a devotion to the arts."[4]

Roush reviewed the literature on university teaching from the late 1960's to 1983. He identified factors critical to college teaching success which included:

"A. Excellent knowledge of subject matter.
B. Dynamic classroom relationships and ability to evoke meaningful classroom response.
C. Ability to involve students in their own education.
D. Enthusiasm for subject and teaching.
E. Empathetic understanding of the student."[5]

Additionally he identifies fairness in assessment and teacher impact on students outside the classroom as critical in effective teaching. Roush also believes teachers of distinction and imagination can develop creativity and values in teaching that are significant in teaching effectiveness.

Williams present an interesting treatise on "How to Teach.... Badly". He said that beyond the freshmen year students have more experience, but not necessarily better teachers. Reasons for the lack of excellence in teaching are principally five, "First, it is rare to find any teacher who has not succumbed ...to the pressures of the system in the matter of examinations, grades, and credits. The ideal he holds up to himself is to teach a good stiff course.... A second reason why teachers of upper classes are seldom good teachers....is that they somehow get the notion that 'upholding the standards of the university' means essertially giving many low grades. A third reason...is the idea that learning is unpleasant work. A fourth reason for bad teaching is mere negligence and indifference on the part of the professor. A final reason..... is the lack of a personality that can put itself in rapport with many types of student personalities, understand how to interest and stimulate young minds, and perceive the many facets that many minds may discover in most types of human knowledge."[6]

The attempts at accurately defining excellence in teaching goes on and on and the need for a measureable, clear, operational definition still exists. For purposes of this paper, the competencies characteristic of "good" teachers include: excellent knowledge of subject area; good organization; enthusiasm for subject and teaching; empathy toward students; good communications; fairness and impartiality; adaptablity to new techniques and knowledge; development of creative and inquiring minds; a sense of humor.

One of the many ways the educator can attempt to improve his effectiveness is through the use of "high tech" aids. Historically, the classroom lecture has been the dominant means of educational delivery. Yet today the teacher is confronted with peers, administrators, and salesmen

encouraging the use of various technological schemes to improve teaching effectiveness.

Technologies

Twenty years ago terms such as computer assisted/managed instruction, audio tape cassettes, microcomputer-based courses, video discs, push button materials and geostationary satellites were uncommon or did not exist. The use of these technologies has in turn helped to introduce new concepts such as value added instruction and distance learning.

Technological Educational Methods-Will They Help?

The wise use of technology such as audio-visual aids or computers in teaching can create excitement and enthusiasm in the educational environment. Computers, for example, can improve efficiency in storing and retrieving data and can be a great source of pleasure while acquiring new knowledge. High tech equipment in teaching should be viewed as an additional resource to improve teaching.

This technology can greatly assist students who wish to learn on their own. While discussing newer trends in teaching, Boaz describes self-paced instruction as "a departure from traditional regular class meetings. Self-paced instruction and the use of television programming to instruct students are alternative teaching methods."[7] Through technology, students who live great distances from campus can still be actively involved in curricular activities and, at the same time, influential experts can share their knowledge on campus through telecommunications and video.

Senese believes, "The computer, as well as other technological innovations, can provide us with a means of offering improved educational opportunities in a cost effective manner."[8] Kemp agrees and suggests, "Based on learning theory and communications research, the technology of instruction provides the means whereby learning can be effective and efficient."[9] He emphasizes the value of audio visual materials in learning by adding that "they make education more productive, individual, immediate, equal for learners and give instruction a more scientific base."[10] The same advantages can probably be cited for other high tech teaching technologies.

Denton et. al., examined instructional strategies while exploring the effectiveness of two-way television. Based on data collected from 32 presentations by 7 professors in the College of Medicine at Texas A&M University over 9 months they concluded that "...achievement was at least as high on materials presented over two-way television as they were on materials presented with the professor present in the classroom."[11]

If a teacher is effective, the appropriate use of a high tech teaching mechanism will increase teaching effectiveness. It will do so not necessarily because of the high tech equipment, but because the effective educator has the intuitive - if not the technical - ability to select and use technological equipment to enhance his skills. Technology should be an additional tool in his teaching arsenal; a tool which he will use to create situations in which students will learn more effectively.

Limitations To The Use Of High Tech Technologies

It is highly unlikely that all the technologies produced by high tech companies can do much to improve teaching effectiveness if an instructor lacks teaching ability. Technological teaching methods cannot be used as a prop to

improve poor teaching. Likewise, they can do little to improve the skill of a poor communicator, or the teacher with little enthusiasm, organization or counseling ability.

Herschbach identifies some areas of concern in the use of educational technology. He says: "1. Technology producers and the public are leading the movement for educational technology, but no coherent policy exists... 2. Educational technology, particularly software, is not at the present time cost effective. [This is not in exact agreement with Senese!] 3. Educational technology is not necessarily more effective than conventional educational techniques. 4. Educational technology is used more for 'value added' instruction that has a positive effect on students, although it is difficult to measure."[12] Sardello in describing the technological threat to education suggests, "Microcomputers in the classroom pose a technological threat to learning because they transform education into psychology."[13] In the same manner, Simpson warns that "computers can be a valuable instructional device when they are used to support teachers rather than replace them."[14]

Knapper while discussing barriers to adoption of instructional technology states, "...research evidence for the effectiveness of technology based instruction compared to traditional teaching methods is equivocal" and he goes on to say, "Furthermore, teachers may be understandably reluctant to relinquish the minute-by minute control over the learning process to a technology based system that they barely understand."[15]

Non-acceptance of technology in adult education may also be a problem as Knapper notes, "Learners - particularly the increasing population of mature students - often place a high value on human and social contacts and may

resist teaching that is controlled primarily by a machine, however ingeniously it is programmed."[16]

The Professor

Teachers have a habit of teaching the way they have been taught. Those who have not been exposed to curricula which improve teaching communication skills lack appreciation for different or improved teaching methods. It is doubtful, for example, that the curriculum required for a Ph.D. in biology would require any courses in teaching methods or technological teaching methods. Furthermore, the likelihood of receiving effective teaching training through such biological courses is marginal. Having been "awarded" a doctorate upon graduation and told by the commencement speaker et. al., of his academic brilliance, it is doubtful if the graduate would be receptive to the idea that his teaching could be improved. Certainly it would not seem to him that any of his colleagues (much less administrators) could improve his teaching.

Change, however, is all around the teacher. As decreased budgets, declining enrollments, and student/teacher evaluations begin to exert pressure, his boss will begin urging him to improve his teaching skills. While the teacher may have experience, experience alone will not suffice.

All this change will not be easy for the instructor or the organization. While discussing such things, Rogers cites Bagehot as he says, "One of the greatest pains to human nature is the pain of a new idea. It...makes you think that after all, your favorite notions may be wrong, your firmest beliefs ill-founded... Naturally, therefore, common men hate a new idea, and are disposed more or less, to ill-treat the original man who brings it."[17] Frye adds another dimension to this problem as he states, "Adoption of new technologies will be delayed because most schools which cannot adapt to the

new technologies may face aggressive competition for students from those who can."[18] He also notes, "Faculty needs reassurance that improving productivity through new learning systems will not result in a loss of status or benefits."[19] He then adds,..."faculty should understand that breaking the constraints of classroom instruction can lead to greater rewards and success. In new systems the faculty member is often more of a learning manager than a classroom teacher."[20]

Cross espoused the proposition that "college teaching can be improved... because improvement is desperately needed and...we do know how to do it... but...[we are] less sanguine that it will be improved." In her study of 706 responses from a randomly selected sample of roughly half of the faculty on three Nebraska campuses, Cross concluded that "[the professors] are not well informed about knowledge related to the evaluation of teaching, student learning, or instructional innovation, and worse yet, they seem reluctant to learn."[21]

Weaver suggests, however, "Good teachers are made, not born..."[22] Every college professor has the professional obligation to constantly examine technological education methods, try them and adopt those which improve his/her effectiveness as a teacher. To do anything less short changes his students, degrades him professionally and leaves him stale as a teacher. It is professionally immoral for a teacher to use the same notes, or organizational and teaching methods he was using five years ago, much less twenty years ago.

The Administrative Responsibility

The responsibility of the organization in such a situation is to provide opportunities, encouragement and incentives. If administrators are sincere

about their wish to improve teaching, then it is necessary that favorable situations be created where professional growth can be developed. In turn, if administrative rhetoric declares that rewards will follow improved teaching, then ensuing behavior must be consistent with what is said.

Opportunity must also include appropriate supervisory behavior. Professors must have opportunities to see, try, fail and succeed in a positive atmosphere. Enough time must also be allotted to get the "feel" of a new piece of equipment. It is professionally unacceptable to have a training requirement added to already heavy work loads and such a requirement will probably decrease morale and teaching effectiveness. Requiring one to pursue drastic change poses a real threat to one's self-esteem, self-respect and status. It is necessary then for the supervisor to provide encouragement and an environment for improved teaching by helping him through the adoption process. This personal involvement will test the excellence of supervisory abilities, but to settle for less will slow adoption of new equipment.

If a professor has made the effort and results indicate teaching has been improved, then two types of reward must be apparent. First the reward must be evident in his salary. Secondly, and more importantly, he must receive a verbal and written statement of a job well done.

Clearly, teaching excellence is the responsibility of the institution as well as the individual faculty member. Peters and Waterman in their book "In Search of Excellence" provide a significant clue to organizational excellence.[23] They maintain most organizations are composed of average individuals. However, the organizations recognized as excellent have found the means of allowing unusual effort on the part of these average individuals. Logically then, teaching excellence will occur when institutions create the environment to allow the average faculty member to achieve teaching excellence.

The Future

Educational technologies are with us and will continue to be developed at a progressive rate. Payne agrees as she states "There is an emphasis on advanced technology, with computers being used in over 50 percent of all secondary and over 20 percent of all elementary schools throughout the country."[24] As these students - or at least some of them - advance to universities the requirement for professors to use technological tools and be computer literate will inevitably increase.

While predicting the future, nothing can be more certain than that situations will change and the present will never again be the same. It will be a sad day for university faculties if they feel that since they have always had a corner on providing higher education, they will have it in the future. One only has to observe the popularity of the junior and community colleges to realize their students numbers are increasing and - at least partially - at the expense of the 4-year institutions.

A number of private business and training programs already exist in the United States. In a telephone conversation with Comstock, he noted that, "The degree advancement programs offered through such notable organizations as General Motors, Chrysler, Du Pont Chemical, and IBM are for upper divisions of management and engineers to further their skills without the required residence at the university setting. The programs at this time are not accredited but this does not mean much since most advanced graduate programs recognize this type of training and will consider it as prerequisite work toward advanced degrees."[25]

Comstock goes on to say, "a large group of programs offered within business and industry, such as A.T.& T., Texas Instruments, and Sandia Laboratories, develop curriculia cooperatively with universities with degrees

granted through the underwriting universities."[26] Wang Institute of Computer Software, Arthur D. Little, Inc., and the Rand Graduate Institute have developed specialized graduate programs accredited by regional accreditation councils. The Naval Postgraduate Program in San Diego and the Air Force Institute of Technology in Ohio are examples of fully accredited programs designed to meet the needs of the military.

"While", as Comstock indicates, "these programs are not as threatening as one might first perceive, they are here and likely to grow." In the future, those which survive will offer higher education most efficiently and effectively based on - among other things - high quality teaching. Only those who are excellent teachers and who are constantly striving to improve themselves will survive in such an environment. High tech educational resources offer promising and exciting opportunities for those who use them.

Summary

High tech teaching tools are here and their availability and use will accelerate in the future. They offer great opportunities to improve teaching situations as well as allowing interaction among people who are great distances from campus.

All this change, however, will try college administrators and individual professors. Administrators must create positive situations for teachers at all levels to involve themselves in observing, experimenting and adopting new teaching technologies. Since technology can improve teaching, especially of effective teachers, this is an opportunity that cannot be neglected

FOOTNOTES

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26. IBID.